

## CLAIMS

1. A composition for solubilization of paclitaxel comprising 4 ~ 90 % by weight of at least one monoglyceride compound, 0.01 ~ 90 % by weight of at least one oil and 0.01 ~ 20 % by weight of paclitaxel.
- 5      2. The composition for solubilization of paclitaxel according to Claim 1, wherein said monoglyceride is selected from a group consisting of saturated or an unsaturated monoglyceride compounds having 10 ~ 22 carbon atoms in the hydrocarbon chain.
- 10      3. The composition for solubilization of paclitaxel according to Claim 2, wherein said monoglyceride compound is selected from monoolein, monopalmitolein, monomyristolein, monoelaidin, and monoerucin, or from a group consisting of the mixture of monoglycerides semi-synthesized from triglycerides of vegetable or animal oil.
- 15      4. The composition for solubilization of paclitaxel according to Claim 1, wherein said oil is selected from a group consisting of triglyceride, iodized oil, vegetable oil and animal oil.
- 20      5. The composition for solubilization of paclitaxel according to Claim 4, wherein said triglyceride is selected from a group consisting of saturated and unsaturated triglycerides having 2 ~ 20 carbon atoms in each hydrocarbon chain.
6. The composition for solubilization of paclitaxel according to Claim 5, wherein said triglyceride is selected from a group consisting of triacetin, tributyrin, tricaproin, tricaprylin, tricaprin and triolein.
7. The composition for solubilization of paclitaxel according to Claim 4,

wherein said iodized oil is selected from a group consisting of Lipiodol, iodized poppy seed oil, Ethiodol and iodized soybean oil.

- 5           8. The composition for solubilization of paclitaxel according to Claim 4, wherein said vegetable oil is selected from a group consisting of soybean oil, cottonseed oil, olive oil, poppyseed oil, linseed oil and sesame oil.
9. The composition for solubilization of paclitaxel according to Claim 4, wherein said animal oil is selected from a group consisting of squalane and squalene.
- 10       10. The composition for solubilization of paclitaxel according to Claim 1 additionally comprising 0.01 ~ 5 % by weight of other additives.
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- 15       11. The composition for solubilization of paclitaxel according to Claim 10, wherein said other additives are selected from the group consisting of Cremophor, tocopherol, tocopherol acetate, fatty acids, fatty acid esters, fatty acid alcohols, insoluble drugs, alcohols and polyols.
12. The composition for solubilization of paclitaxel according to Claim 11, wherein said insoluble drugs are selected from the group consisting of anticancer drugs, p-glycoprotein inhibitors and hepatic metabolism blockers.
- 20       13. The composition for solubilization of paclitaxel according to Claim 12, wherein said anticancer drugs are selected from the group consisting of doxorubicin, cisplatin, carboplatin, carmustin (BCNU), dacarbazine, etoposide, 5-fluorouracil and paclitaxel derivatives.
14. The composition for solubilization of paclitaxel according to Claim 12,

wherein said paclitaxel derivatives are selected from the group consisting of docetaxel, bromotaxel and taxotere.

15. The composition for solubilization of paclitaxel according to Claim 12, wherein said p-glycoprotein inhibitors are selected from the group consisting of cinchonin, calcium channel blockers, calmodulin antagonists, antihypertensives, Vinca alkaloids, steroids, antiarrhythmics, anthelmintics and immunosuppressants.
16. The composition for solubilization of paclitaxel according to Claim 15, wherein said calcium channel blockers are selected from the group consisting of verapamil and dihydropyridines such as nifedipine, nicardipine and nitrendipine.
17. The composition for solubilization of paclitaxel according to Claim 15, wherein said calmodulin antagonists are selected from the group consisting of trifluoroperazine.
18. The composition for solubilization of paclitaxel according to Claim 15, wherein said antihypertensives are selected from the group consisting of reserpine.
19. The composition for solubilization of paclitaxel according to Claim 15, wherein said Vinca alkaloids are selected from the group consisting of vincristine and vinblastine.
20. The composition for solubilization of paclitaxel according to Claim 15, wherein said steroids are selected from the group consisting of progesterone.
21. The composition for solubilization of paclitaxel according to Claim 15,

wherein said antiarrhythmics are selected from the group consisting of amiodarone and quinidine.

22. The composition for solubilization of paclitaxel according to Claim 15, wherein said anthelmintics are selected from the group consisting of quinacrine and quinine.

23. The composition for solubilization of paclitaxel according to Claim 15, wherein said immunosuppressants are selected from the group consisting of cyclosporine A, staurosporine and tacrolimus.

24. The composition for solubilization of paclitaxel according to Claim 12, wherein said hepatic metabolism blockers are selected from the group consisting of cyclosporin A, anticancer drugs such as doxorubicin, etoposide (VP-16) and cisplatin, verapamil and tamoxifen.

25. The composition for solubilization of paclitaxel according to Claim 11, wherein said alcohols are selected from the group consisting of methanol, ethanol, propanol and isopropanol.

26. The composition for solubilization of paclitaxel according to Claim 11, wherein said polyols are selected from the group consisting of ethyleneglycol, propyleneglycol and polyethyleneglycol.

27. The composition for solubilization of paclitaxel according to any one of Claims 1 through 26, wherein the administration route is selected from oral administration, buccal administration, mucosal administration, intranasal administration, intraperitoneal administration, subcutaneous injection, intramuscular injection, transdermal administration, intratumoral injection.

28. A method of preparing the composition for solubilization of paclitaxel according to any one of Claims 1 through 26, wherein said method comprises the steps of:

- 5           1) solubilizing 4 ~ 90% by weight of at least one monoglyceride compound in 0.01 ~ 90 % by weight of at least one oil; and
- 2) solubilizing completely 0.01 ~ 20 % by weight of paclitaxel in said mixture in step (1) by stirring.

29. The preparation method according to Claim 28, wherein the said  
10           mixture is heated to 50 °C in step (1) to speed up the solubilization process.

30. The preparation method according to Claim 28, wherein the said mixture is heated to 50 °C and sonicated in a bath type sonicator in step (2) to speed up the solubilization process.

15       31. A method of preparing the composition for solubilization of paclitaxel according to any one of Claims 1 through 26, wherein said method comprises the steps of mixing 4 ~ 90% by weight of at least one monoglyceride compound, 0.01 ~ 90 % by weight of at least one oil and 0.01 ~ 20 % by weight of paclitaxel and solubilizing completely.

20       32. The preparation method according to Claim 31, wherein the said mixture is heated to 50 °C and sonicated in a bath type sonicator to speed up the solubilization process.

33. A composition for solubilization of paclitaxel including emulsifier comprising 4 ~ 90 % by weight of at least one monoglyceride

compound, 0.01 ~ 90 % by weight of at least one oil, 0.01 ~ 90 % by weight of at least one emulsifier and 0.01 ~ 20 % by weight of paclitaxel.

5 34. The composition for solubilization of paclitaxel including emulsifier according to Claim 33, wherein said monoglyceride is selected from a group consisting of saturated or an unsaturated monoglyceride compounds having 10 ~ 22 carbon atoms in the hydrocarbon chain.

10 35. The composition for solubilization of paclitaxel including emulsifier according to Claim 34, wherein said monoglyceride compound is selected from monoolein, monopalmitolein, monomyristolein, monoelaidin and monoerucin, or from a group consisting of the mixture of monoglycerides semi-synthesized from triglycerides of vegetable or animal oil.

15 36. The composition for solubilization of paclitaxel including emulsifier according to Claim 33, wherein said oil is selected from a group consisting of triglyceride, iodized oil, vegetable oil and animal oil.

20 37. The composition for solubilization of paclitaxel including emulsifier according to Claim 36, wherein said triglyceride is selected from a group consisting of saturated and unsaturated triglycerides having 2 ~ 20 carbon atoms in each hydrocarbon chain.

38. The composition for solubilization of paclitaxel including emulsifier according to Claim 37, wherein said triglyceride is selected from a group consisting of triacetin, tributyrin, tricaproin, tricaprylin, tricaprin and triolein.

39. The composition for solubilization of paclitaxel including emulsifier according to Claim 37, wherein said iodized oil is selected from a group consisting of Lipiodol, iodized poppy seed oil, Ethiodol and iodized soybean oil.
- 5 40. The composition for solubilization of paclitaxel including emulsifier according to Claim 37, wherein said vegetable oil is selected from a group consisting of soybean oil, cottonseed oil, olive oil, poppyseed oil, linseed oil and sesame oil.
- 10 41. The composition for solubilization of paclitaxel including emulsifier according to Claim 37, wherein said animal oil is selected from a group consisting of squalane and squalene.
- 15 42. The composition for solubilization of paclitaxel including emulsifier according to Claim 33, wherein said emulsifier is selected from a phospholipid, a non-ionic surfactant, an anionic surfactant, a cationic surfactant and bile acid.
- 20 43. The composition for solubilization of paclitaxel including emulsifier according to Claim 42, wherein said phospholipid is selected from the group consisting of a phosphatidylcholine (PC) and its derivative, a phosphatidylethanolamine (PE) and its derivative, a phosphatidylserine (PS) and its derivative, and a polymeric lipid wherein a hydrophilic polymer is conjugated to the lipid headgroup.
- 25 44. The composition for solubilization of paclitaxel including emulsifier according to Claim 42, wherein said non-ionic surfactant is selected from the group consisting of a poloxamer (Pluronic: polyoxyethylene-polyoxypropylene copolymer), a sorbitan ester

(sorbitan esters; Span), a polyoxyethylene sorbitan (Tween) and a polyoxyethylene ether (Brij).

45. The composition for solubilization of paclitaxel including emulsifier according to Claim 42, wherein said anionic surfactant is selected from the group consisting of a phosphatidylserine (PS) and its derivative, a phosphatidic acid (PA) and its derivative, and sodium dodecyl sulfate (SDS).

46. The composition for solubilization of paclitaxel including emulsifier according to Claim 42, wherein said cationic surfactant is selected from the group consisting of 1,2-dioleoyl-3-trimethylammonium propane (DOTAP), dimethyldioctadecylammonium bromide (DDAB), N-[1-(1,2-dioleoyloxy)propyl]-N,N,N-trimethylammonium chloride (DOTMA), 1,2-dioleoyl-3-ethylphosphocholic acid (DOEPC) and 3 $\beta$ -[N-[(N',N'-dimethylamino)ethan]carbonyl]cholesterol (DC-Chol).

47. The composition for solubilization of paclitaxel including emulsifier according to Claim 42, wherein said bile acid is selected from the group consisting of cholic acid, its salt and derivatives; deoxycholic acid, its salt and derivatives; chenocholic acid, its salt and derivatives; and lithocholic acid, its salt and derivatives.

48. The composition for solubilization of paclitaxel including emulsifier according to Claim 33 additionally comprising 0.01 ~ 5 % by weight of other additives.

49. The composition for solubilization of paclitaxel including emulsifier according to Claim 48, wherein said other additives are selected from the group consisting of Cremophor, tocopherol, tocopherol acetate,

fatty acids, fatty acid esters, fatty acid alcohols, insoluble drugs, alcohols and polyols.

50. The composition for solubilization of paclitaxel including emulsifier according to Claim 49, wherein said insoluble drugs are selected from the group consisting of anticancer drugs, p-glycoprotein inhibitors and hepatic metabolism blockers.

51. The composition for solubilization of paclitaxel including emulsifier according to Claim 50, wherein said anticancer drugs are selected from the group consisting of doxorubicin, cisplatin, carboplatin, carmustin (BCNU), dacarbazine, etoposide, 5-fluorouracil and paclitaxel derivatives.

52. The composition for solubilization of paclitaxel including emulsifier according to Claim 50, wherein said paclitaxel derivatives are selected from the group consisting of docetaxel, bromotaxel and taxotere.

53. The composition for solubilization of paclitaxel including emulsifier according to Claim 50, wherein said p-glycoprotein inhibitors are selected from the group consisting of cinchonins, calcium channel blockers, calmodulin antagonists, Vinca alkaloids, antiarrhythmics, steroids, antihypertension drugs, anthelmintics and immunosuppressants.

54. The composition for solubilization of paclitaxel including emulsifier according to Claim 53, wherein said calcium channel blockers are dihydropyridines selected from the group consisting of verapamil, nifedipine, nicardipine and nitrendipine.

55. The composition for solubilization of paclitaxel including emulsifier according to Claim 53, wherein said calmodulin antagonist is trifluoroperazine.
56. The composition for solubilization of paclitaxel including emulsifier  
5 according to Claim 53, wherein said antihypertension drug is reserpine.
57. The composition for solubilization of paclitaxel including emulsifier according to Claim 53, wherein said Vinca alkaloids are selected from the group consisting of vincristine and vinblastine.
- 10 58. The composition for solubilization of paclitaxel including emulsifier according to Claim 53, wherein said steroid is progesterone.
59. The composition for solubilization of paclitaxel including emulsifier according to Claim 53, wherein said antiarrhythmics are selected from the group consisting of amiodarone and quinidine.
- 15 60. The composition for solubilization of paclitaxel including emulsifier according to Claim 53, wherein said anthelmintics are selected from the group consisting of quinacrine and quinine.
61. The composition for solubilization of paclitaxel including emulsifier according to Claim 53, wherein said immunosuppressants are  
20 selected from the group consisting of cyclosporins, staurosporin and tacrolimus.
62. The composition for solubilization of paclitaxel including emulsifier according to Claim 50, wherein said hepatic metabolism blockers are selected from the group consisting of anticancer drugs including

cyclosporin A, doxorubicin, etoposide (VP-16) and cisplatin, verapamil and tamoxifen.

63. The composition for solubilization of paclitaxel including emulsifier according to Claim 49, wherein said alcohols are selected from the group consisting of methanol, ethanol, propanol and isopropanol.

64. The composition for solubilization of paclitaxel including emulsifier according to Claim 49, wherein said polyols are selected from the group consisting of ethyleneglycol, propyleneglycol and polyethyleneglycol.

65. The composition for solubilization of paclitaxel including emulsifier according to any one of Claims 33 through 64, wherein the administration route is selected from oral administration, buccal administration, mucosal administration, intranasal administration, intraperitoneal administration, subcutaneous injection, intramuscular injection, transdermal administration and intratumoral injection.

66. A method of preparing the composition for solubilization of paclitaxel including emulsifier according to any one of Claims 33 through 64, wherein said method comprises the steps of:

- 1) preparing the viscous liquid by mixing 4 ~ 90% by weight of at least one monoglyceride compound, 0.01 ~ 90 % by weight of at least one oil and 0.01 ~ 90 % by weight of at least one emulsifier by heating to below 50 °C (step 1); and
- 2) preparing homogeneous mixture by solubilizing completely 0.01 ~ 20 % by weight of paclitaxel in said mixture in step (1) (step 2).

67. The method of preparing the composition for solubilization of paclitaxel including emulsifier according to Claim 66, wherein the said mixture is heated to 50 °C in step (1) to speed up the solubilization process.

5 68. The method of preparing the composition for solubilization of paclitaxel including emulsifier according to Claim 66, wherein the said mixture is heated to 50 °C in step (2) to speed up the solubilization process.

10 69. The method of preparing the composition for solubilization of paclitaxel including emulsifier according to Claim 66 wherein the said mixture is sonicated in a bath type sonicator in step (2) to speed up the solubilization process.

15 70. A method of preparing the composition for solubilization of paclitaxel including emulsifier according to any one of Claims 33 through 64, wherein said method comprises the steps of:

- 1) preparing the paclitaxel solution by solubilizing 0.01 ~ 20% by weight of paclitaxel in 0.01 ~ 90 % by weight of at least one oil by sonicating in a bath type sonicator (step 1); and
- 2) preparing homogeneous mixture by mixing the paclitaxel  
20 solution in step (1) and 0.01 ~ 90 % by weight of at least one emulsifier and 4 ~ 90 % by weight of monoglyceride (step 2).

71. The method of preparing the composition for solubilization of paclitaxel including emulsifier according to Claim 70, wherein the said mixture is heated to 50 °C and sonicated in a bath type sonicator in

step (2) to speed up the solubilization process.

72. The composition for solubilization of paclitaxel including emulsifier according to any one of Claims 1 through 26 and Claims 33 through 64, wherein the said composition is liquid or semi-solid state at room temperature.

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